

Con. 2482-07.

(REVISED COURSE)

ND-917

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** out of the remaining **six** questions.
 (3) Assume **suitable** additional data if **necessary** and **state** them **clearly**.

1. (a) Explain the principle of a strain gauge and derive an expression for gauge factor. 10
 Explain how strain can be measured in a column. What is a dummy gauge ?
- (b) What is an LVDT ? What are the parameters that can be measured by this ? Describe 10
 with diagram and output characteristics the principle of its construction and operation.
2. (a) What are the different radiation law on which radiation thermometers are based ? 10
 How is emission important in ascertaining correct temperature to a target surface ?
- (b) For a platinum resistance thermometer, the resistance coefficient of temperature 10
 is $0.004 \Omega/\Omega/^\circ\text{C}$ resistance at 40°C is 130Ω . Find the following :
 (i) resistance at 300°C ;
 (ii) temperature when resistance is 90Ω .
3. (a) What are the different methods of low pressure measurement ? Explain McLeod 10
 gauge for low pressure measurement ?
- (b) Explain any one electrical method of differential pressure measurement. 10
4. (a) List different flow measuring devices with a neat sketch, explain the operation of 10
 a magnetic flowmeter. What are its advantages and limitations ?
- (b) Describe different methods of liquid level measurement. 10
5. (a) Describe different types of capacitive transducers and compare their sensitivities. 10
 Give one application of each.
- (b) Draw schematic diagrams for analogue multiplexed data acquisition system and 10
 digital multiplexed data acquisition system. Compare their merits and demerits.
6. (a) Show that the steady state response of a piezoelectric transducer to a step 10
 input is zero.
- (b) Classify and explain inductive transducers. 10
7. Write short notes on : 20
 - (a) Torque Measurement
 - (b) Virtual Instrumentation
 - (c) Humidity Measurement
 - (d) Pitot Tube.